Amendments to the Claims

This listing of claims will replace all prior versions, and listings, of claims in the application:

Listing of Claims:

Claim 1 (previously presented): A method for labeling synthesis of ketones, comprising:

(a) providing a high pressure reaction chamber having a liquid inlet and a gas inlet in a

bottom surface thereof,

(b) providing a solution to be labeled comprising a triflate of formula R_1 -OTf, wherein R_1

is linear or cyclic alkyl or substituted alkyl or a heteroaryl group; a boronic acid

having a formula RB(OH)₂, wherein R is linear or cyclic alkyl or substituted alkyl,

aryl or substituted aryl; and a transitional metal complex,

(c) introducing a carbon-isotope monoxide enriched gas-mixture into the reaction

chamber of the UV reactor assembly via the gas inlet,

(d) introducing at high pressure said solution mixed with transition metal complex into

the reaction chamber via the liquid inlet,

(e) waiting for a predetermined time while the labeling synthesis occur, and

(f) removing the labeled ketones from the reaction chamber.

Claim 2 (original): A method of claim 1, wherein the carbon-isotope monoxide enriched gas-

mixture is produced by a method comprising:

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(a) providing carbon-isotope dioxide in a suitable carrier gas,

(b) converting carbon-isotope dioxide to carbon-isotope monoxide by introducing said

gas mixture in a reactor device,

trapping carbon-isotope monoxide in a carbon monoxide trapping device, wherein (c)

carbon-isotope monoxide is trapped but not said carrier gas, and

(d) releasing said trapped carbon-isotope monoxide from said trapping device in a well

defined micro-plug, whereby a volume of carbon-isotope monoxide enriched gas-

mixture is achieved.

Claim 3 (original): A method of claim 1, wherein the carbon-isotope is ¹¹C, ¹³C, or ¹⁴C.

Claim 4 (original): A method of claim 1, wherein the carbon-isotope is ¹¹C.

Claim 5 (original): A method of claim 1, wherein the step of introducing the solution to be

labeled mixed with a transitional metal complex is performed using a pressure that is about

80 times higher than the pressure before the introduction, in order to maintain a pseudo one-

phase system.

Claim 6 (original): A method of claim 1, wherein the step of waiting a predetermined time

comprises adjusting the temperature of the reaction chamber to enhance the labeling

synthesis.

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Claim 7 (original): A method of claim 1, wherein the transitional metal complex is a palladium metal complex.

Claim 8 (cancelled)

Claim 9 (previously presented): The method of claim 1, wherein R_1 is $C_{10}H_7$ or



Claim 10 (cancelled)

Claim 11 (previously presented): A method of claim 1, wherein R is selected from phenyl,

methyl, or theinyl.

Claim 12 (original): A method of claim 1, wherein the solution to be labeled is further mixed with lithium bromide to facilitate the reaction.

Claim 13 (original): A labeled ketone synthesized according to a method of claim 1 having a formula of R1-C*O-R, wherein * is labeled carbon position, and R1 and R are independently linear or cyclic alkyl or substituted alkyl, aryl or substituted aryl.

Claims 14-23 (cancelled)